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THE NORTH AMERICAN LITTORELLA.

M. L. Fernald.

One of the rarest plants of the North American flora is the peculiar little member of the *Plantaginaceae* which is called in our floras *Littorella uniflora* (L.) Asch. The plant is known from only a few sandy or muddy shores from Newfoundland to Minnesota and, ever since its original discovery on this continent in 1868, it seems to have been treated without question as identical with the European species, *L. uniflora*. This treatment, originating when the plant was very little known in America and material inadequate, can no longer be maintained, since we now have sufficient material of the North American plant to show that it is constant in its characters and that in nearly every feature it is distinct from the European *L. uniflora*.

The latter plant, which apparently is less rare in Europe than is its representative in America, has a stoutish rootstock, shown in *Flora Danica* or in the *English Botany* as about 0.5 cm. in diameter; the American plant having the rootstock filiform. The European plant has many of the roots thickened and cord-like, becoming almost fusiform; the American has them all filiform. In the European species the leaves are subterete or semi-cylindric and 0.3–1.5 dm. long, with a conspicuously dilated and sheathing scarious stipular base. The American plant, on the other hand, has the leaves flattish, 1.5–5 cm. long, with the scarious base very narrow. In the European species the peduncles of the staminate flowers are 1–6 cm. long, the calyces 4–7 mm. long, with lanceolate segments; and the filaments are 2–4 cm. long, the anthers 2.5–3 mm. long. In the American plant the peduncles of the staminate flowers are only 0.7–2 cm. long; the

calyx 2.5–4 mm. long, with oblong segments; the filaments 0.7–1.2 cm. long, and the anthers 2–2.4 mm. long. The European plant fruits freely, the fruits protruding from the leaf-axils, many of the European specimens showing perfectly mature fruit in late June, July and August, while some of the staminate flowers are still in anthesis; but little of the American material, collected even as late as August and September, shows any trace of mature fruit. Such mature achenes as have been found in the American material show, however, that, whereas the European *L. uniflora* has the thick-oblong pale-brown achene coarsely rugose, the North American plant has the more slender blackish achene nearly smooth or at most barely rugulose. The North American plant is, therefore, distinct from the European in many of its most important characters and it is here proposed as

Littorella **americana**, n. sp., *L. uniflorae* habitu floribusque simile; rhizomate radicibusque filiformibus; foliis planiusculis falcato-arcuatis vel rectis 1.5–5 cm. longis basi scariosa angusta; pedunculis florum masculorum 0.7–2 cm. longis nudis vel 1-bracteatis, bractea plerumque supra medium; calycibus 2.5–4 mm. longis, segmentis oblongis; filamentis 7–12 mm. longis; antheris 2–2.4 mm. longis; acheniis anguste oblongis 2 mm. longis 0.6 mm. crassis nigrescentibus sublaevibus vel rugulosis.

Similar in habit and flowers to *L. uniflora:* rhizome and roots filiform: leaves flattish, falcate-arcuate or straightish, 1.5–5 cm. long; the scarious base narrow: peduncles of staminate flowers 0.7–2 cm. long, naked or 1-bracteate; the bract usually above the middle: calyx 2.4–4 mm. long; the segments oblong: filaments 7–12 mm. long: anthers 2–4 mm. long: achenes narrowly oblong, 2 mm. long, 0.6 mm. thick, blackish, smoothish or rugulose.— Sandy or muddy shores of lakes, ponds and quiet streams, Newfoundland and Nova Scotia to Minnesota. Newfoundland: muddy banks of Exploits River near the mouth of Badger Brook, August 13, 1894, *Robinson & Schrenk*, no. 1; sandy and gravelly shores of ponds, Whitbourne, August 8, 1911, *Fernald & Wiegand*, no. 6219. Nova Scotia: Grand Lake, July 15, 1879, *Elizabeth G. Knight.* Maine: Chemo Pond, Bradley, September, 1891, *F. P. Briggs.* Vermont: shore of Lake Champlain, Alburgh, September 2, 1879, *C. G. Pringle;* abundant, but local, at Spectacle Pond, Wallingford, July 7 and September 4, 1898, *W. W. Eggleston & E. C. Kent* (type in Gray Herb.); July 11, 1899, *Eggleston;* Notch Pond, Ferdinand, August 2–12, 1899, *Eggleston*, no. 1539. Ontario: Ship Island in Gull Lake, Victoria Co., July 29, 1868, *J. Macoun.* Minnesota: Basswood Lake, July 28, 1886, *L. H. Bailey*, no. 437.

Gray Herbarium.

NOTES ON BETULA.

W. W. Ashe.

The finding in the mountains of North Carolina of *Betula papyrifera cordifolia* (Regel) Fern., not only adds another tree to this intensively investigated region but extends the range of this form southward about 550 miles, Goshen, Litchfield County, Connecticut,[1] and Woods Hole, Massachusetts,[2] being the hitherto most southerly reported eastern stations. A single specimen of this birch was noticed in July 1915, on the eastern flank of Mt. Mitchell, in the Black Mountain range. In March 1916, while I was camping on the summit with my associates in the United States Forest Service, Messrs. Noyes and Damtoft, a large number of these trees were noticed on the western slope of the range. In October 1916, the fruit was scant, but in September 1917, abundant fruiting material was collected from a number of trees. In 1916 fruiting material was referred to Blanchard, who seemed to regard it as typical. These investigations show this species to be generally distributed in these mountains above an altitude of 5500 feet in the spruce and balsam forest. Specimens can be located readily at the following places: east slope of Mt. Mitchell on north side of trail between summit and old sawmill commissary, at an altitude of 6200 feet; in the gap to the north of the second of the Black Brothers peaks, which is about one mile north of Mitchell Peak; on the west side of the crest trail near where the Pensacola trail leaves the Buncombe County trail. Nearly every investigator who has ascended the mountain has passed within a few feet of this last tree.

It is estimated that this species forms about .05 of one per cent of this forest. One specimen measured 16 inches in diameter at breast-height and had an estimated height of 70 feet; but the usual range of diameters is from 10 to 12 inches and corresponding heights of from 40 to 60 feet, exceeding the dimensions recorded for the tree in New England. Prof. Fernald has informed me, however, that he has measured trees of this form in Newfoundland 3 to 4 feet in diameter,

[1] Bissell, in Flow. Pl. of Conn., 148 (1910).
[2] Bartlett, Rhod. 11, 231 (1909).

from which it seems that its best individual development is attained on this island.

There seems to be considerable confusion regarding the status of this form. By the seventh edition of Gray's Manual (335, 1908) and by Sargent (Man. 204, 1905) it is regarded as varietal. Britton (Trees, 251, 1908) gives it specific rank but states that it may be only a form of *B. papyrifera* having heart-shaped leaves and Blanchard also regards it as of specific standing. Prof. G. R. Burns (in lit., 1917) states that it intergrades with the type. The cordate-leaved tree, however, at least in the east, is confined to higher altitudes and has a more northerly range; and it is not known to occur in association with the type in the southern part of New York state, in Pennsylvania or in Ohio. Moreover, this seems to be the only form on the higher summits of New England, where it occurs as a small tree. The fact that the cordate form alone occurs in North Carolina, and that there its leaf-form is strongly marked and without indication of variation — foliage was examined from more than 100 trees — would at least seem to give it excellent varietal if not specific characterization. Specimens from this locality are being deposited in the following herbaria: Gray, Arnold Arboretum, New York Botanical Garden, National, Carnegie and Field.

Betula lenta **uber** n. var. Leaves ovate or short elliptic, 2.5–4 cm. long by 2.3–3.5 cm. wide, rounded or very obtuse at the apex, mostly with a broad, deep basal sinus or sometimes oblique, irregularly serrate with three to six pairs primary veins; petiole 0.5–1 cm. long. Fruit same size and scales same shape as in the type, but nutlets narrowly winged. Bark as in type, and inner bark with characteristic birch oil fragrance and flavor. — Banks of Dickey Creek, Smyth County, Virginia, south of Rye Valley Station. January 14, 1914, W. W. A. Characteristic specimens are being deposited in following herbaria: Gray, Arnold Arboretum, N. Y. Botanical Garden, and National.

U. S. Forest Service, Washington, D. C.

NOTES ON THE CLAYTON HERBARIUM.

S. F. Blake.

(*Continued from p.* 54.)

9. *Convolvulus panduratus* L. Sp. i. 153 (1753).[1] The Clayton specimen (no. 641), on which the Gronovian reference is based, has the leaves pubescent beneath, glabrous calyx, stem, and petioles, and glabrous 1–3-flowered peduncles. The name Ipomoea pandurata (L.) G. F. W. Meyer, Prim. Fl. Esseq. 100 (1818), must be restricted to this form with leaves pubescent beneath. The equally common and widely distributed form with leaves glabrous beneath should bear the name I. pandurata (L.) G. F. W. Mey. var. rubescens Chois. in DC. Prod. ix. 381 (1845).

10. *Gratiola virginiana* L. Sp. i. 17 (1753).[2] In the Linnaean Herbarium are five sheets of this species. One sheet, from Kalm, is the *G. virginiana* of all our manuals. Another, with no data, is the same plant, and a third, likewise without data, is probably identical. A fourth, from India, is a very different and unidentified species, while the fifth is a mixture of *Ammania* and "*Gratiola trifida* Willd." All these specimens, however, are nomenclatorially of no consequence in this connection. The Linnaean species, as a reference to the subjoined description will show, is based primarily on the Gronovian reference, which in turn rests on *Clayton* 379. This plant, in the British Museum, is the short-peduncled *G. sphaerocarpa* Ell. Sk. i. 14 (1816), and the name G. virginiana L. must be taken up for this species.

The long-peduncled plant which has passed for *G. virginiana* or *G. virginica* for a century and a half must now be called Gratiola neglecta Torr. Cat. Pl. N. Y. 10, 89 (1819). The earlier name

[1] *Convolvulus panduratus.*

"4. CONVOLVULUS foliis cordatis integris panduriformibusque, calycibus laevibus.

"Convolvulus foliis inferioribus cordatis, superioribus trilobis, calycibus pedunculis petiolisque glabris, caule rubescente. *Gron. virg.* 141.

"*Habitat in* Virginiae *arenosis.*"

[2] *Gratiola virginiana.*

"3. GRATIOLA foliis lanceolatis obtusis subdentatis. *Gron. virg.* 6.*

"*Habitat in* Virginia."

(In Addenda, Sp. ii. 1200 (1753). "P. 17. Gratiola virginiana (adde) Tsieria Manga Nari. *Rheed. mal.* 9. *p.* 165. *t.* 85."

Gratiola officinalis β. carolinensis Pers. Syn. i. 14 (1805), based on *G. officinalis* Michx. Fl. i. 6 (1803) (not L.), which is *G. neglecta*, is quoted by authors as a binomial and attributed to Persoon, but was first published as such by Pursh (Fl. i. 12 (1814)) in synonymy under *G. officinalis*, and consequently cannot be taken up for the species.

11. *Rhinanthus virginicus* L. Sp. ii. 603 (1753).[1] (*Gerardia virginica* (L.) BSP., as to syn. only.) *Clayton* 488, sole type of this species, now in the British Museum, is not the smooth and glaucous *G. virginica* of our manuals, but the puberulous species which in the Synoptical Flora (ii. pt. 1. 291 (1878)) is called *Gerardia flava* L., and in Britton & Brown's Illustrated Flora (ed. 2. iii. 206 (1913)) *Dasystoma flava* (L.) Wood. The specimen in the Linnaean Herbarium under *Rhinanthus virginicus*, which has been the cause of some confusion, is a South American plant received from Escallon (not before 1776, according to B. D. Jackson), which has been identified by Bentham with some doubt (in DC. Prod. x. 558 (1846)) as *Lamourouxia serratifolia* HBK. As this specimen did not constitute an element of the species as originally published, its exact identity is obviously of no importance in the disposition of the name *Rhinanthus virginicus*.

Attention must be called here to the century-old but erroneous reference, originating doubtless in some confusion of specimens which cannot now be traced, of *Rhinanthus virginicus* to the synonymy of the glaucous plant known to the older authors as *Gerardia quercifolia* Pursh, Fl. ii. 423. t. 19 (1814). The latter name well exemplifies a class of names for which I have recently proposed the designation *nomina legitimata* (Contr. Gray Herb. N. S. no. lii. 51 (1917)), — it having been based on a description belonging to one species and a synonym belonging to another, and afterward restricted by authors to the plant described to the exclusion of the synonym. It seems now impossible to discover the error by which Pursh and Bentham (in DC. Prod. x. 520 (1846)), and subsequently Gray (Syn. Fl. ii. pt. 1. 291 (1878)) and other authors, including Pennell (Bull. Torr. Club xl. 409 (1913)), were led to refer the Clayton specimen, and consequently *Rhinanthus virginicus* L., to the glaucous species, but in any case the fact remains that *Clayton* 488, basis of the Gronovian name, is not that species but is the puberulous plant almost universally called *Gerardia flava* or *Dasystoma flava*.

[1] *Rhinanthus virginicus.*
"5. RHINANTHUS corollis fauce patente, foliis sinuato dentatis. *Gron. virg.* 168.†
"*Habitat in* Virginia."

The Linnaean *Gerardia flava* (Sp. ii. 610 (1753))[1] was a complex of the puberulous species, *G. flava* of authors (as to citations), and the glaucous species, *G. virginica* of authors (as to specimen in Linnaean Herbarium). It has been restricted to the puberulous species by practically all authors except Pennell, who has recently referred it to the glaucous plant figured as *G. quercifolia* by Pursh. Under these circumstances it seems advisable to continue the practice of practically all writers and retain the name in its established application for the puberulous species, designating as type the Clayton specimen (no. 9), cited by Gronovius (p. 74) and now in the British Museum, which I have examined. The two names, *Gerardia flava* and *Rhinanthus virginicus*, of the same date (1753), were first combined by Dr. Pennell (Bull. Torr. Club xl. 409 (1913)), who adopted the name *virginicus* (*Aureolaria virginica* (L.) Pennell). Although this name was unfortunately applied by Dr. Pennell to the glaucous species, the *G. virginica* of the manuals, it must now be used, under another generic name, for the puberulous plant generally called *G. flava*.

The oldest name applying to the glaucous species generally known as *G. virginica*, and the only appropriate one it has ever received, is GERARDIA GLAUCA Eddy, Med. Repos. N. Y. hex. 2. v. 126 (1808). As this work is decidedly rare, it may be well to quote Eddy's description, which occurs in his "Plantae Plandomenses, or a Catalogue of the Plants growing spontaneously in the Neighborhood of Plandome, the Country Residence of Samuel L. Mitchill. By Caspar Wistar Eddy, Student of Medicine," which is dated from "New-York, August 28th, 1807." It runs as follows: "Gerardia glauca,* (*species nova mihi.*) *Descr. G. foliis inferne lyrato-runcinatis serratis, medio pinnatiffido-erratis* [*sic*], *et superne lanceolatis serratis; caule glauco, paniculato; soribus pedunculatis.*" (Footnote.) "*I have also found this plant about two miles and a half from New-York, but first observed the difference between it and the *G. flava* of Linnaeus in the summer of 1805."

In his preliminary paper on the genera of the *Agalineae* (*Gerardieae* of authors), Dr. F. W. Pennell (Bull. Torr. Club xl. 119–130 (1913))

[1] *Gerardia flava.*

"3. GERARDIA foliis lanceolatis pinnato-dentatis, caule simplicissimo.

"Anonymos floribus flavis speciosis digitali aequalibus. *Gron. virg.* 74.

"Digitalis lutea elatior, jaceae nigrae foliis. *Banist. virg.* 1926. *Pluk. mant.* 64. *t.* 368.

"*Habitat in* Virginia, Canada.

"Caulis *pedalis s. altior.* Folia *opposita, lanceolata, subpetiolata* (*Lycopi aut jaceae*), *basi incisa pinnatim sinubus patulis.* Spica *terminalis, laxa, ex Floribus oppositis, magnis, flavis.* Antherae *in duas spinas deorsum tendentes.* Stamen *quintum deest.*"

has proposed to restrict the name *Gerardia* L. to the tropical American genus of *Acanthaceae* usually known as *Stenandrium* Nees. Dr. Pennell's argument may be briefly summarized as follows, reference being made to the original paper by those requiring further information. The name *Gerardia* was adopted by Linnaeus from Plumier, who had used it for an Acanthaceous plant from the West Indies which by various authors has been identified with apparently good reason as *Stenandrium rupestre* (Sw.) Nees.[1] With this plant (*G. tuberosa* L.), not autoptically known to him, Linnaeus associated four other species — *G. purpurea, G. flava, G. pedicularia,* and *G. glutinosa* — all four known to Linnaeus by personal examination, as is evidenced by his comparatively ample descriptions. The Linnaean diagnosis in the fifth edition of the Genera Plantarum refers entirely to *G. tuberosa.* This species was furthermore cited by J. E. Smith in 1810 (Rees's Ency. xvi. no. 1) as the species to which the name must be restricted in case the Linnaean genus should be divided: "Whatever might be the result of such examination [of the fruit], this plant [*G. tuberosa* L.] must be the true, though it were the only *Gerardia,* and the rest in that case must have a new generic appellation and character."

With this treatment by Dr. Pennell, which has been followed by Dr. Britton in the second edition of the Illustrated Flora, the writer finds himself in complete agreement, although he can not subscribe to the recognition as independent genera of the long recognized sections of *Gerardia* which are generally known as *Dasystoma, Otophylla,* and *Eugerardia.* The name *Dasistoma* Raf. (1819), which in the form *Dasystoma* has generally been applied to the *G. virginica* series, is based, according to Pennell, on *Seymeria macrophylla* Nutt. I have not present means of access to the rare work in which Rafinesque's genus is described, but the synopsis of his characters given by Pennell fully substantiates the latter's reference of the generic name to *Seymeria macrophylla* (which by Pennell is retained as generically distinct from *Seymeria* (*Afzelia*)). The yellow-flowered species of the *G. virginica* group were named *Aureolaria* by Rafinesque in 1837, *Panc-*

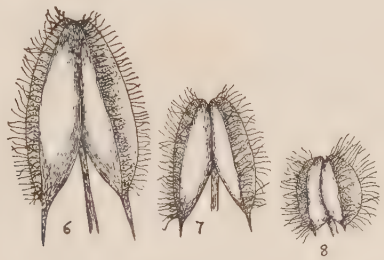
[1] In my recent transfer (Contr. Gray Herb. N. S. no. 52. 100–101 (1917)) of the Mexican and West Indian species of *Stenandrium* to *Gerardia,* two species of the West Indies were accidentally omitted. These are: Gerardia **droseroides** (Nees) comb. nov. (*Stenandrium droseroides* Nees in DC. Prod. xi. 284 (1847)); and Gerardia scabrosa (Sw.) Raf. Fl. Tell. iv. 67 ("1836" = 1837) (*Ruellia ? scabrosa* Sw. Fl. Ind. Occ. ii. 1074 (1800); *Stenandrium scabrosum* (Sw.) Nees in DC. Prod. xi. 284 (1847); Lindau in Urb. Symb. Ant. ii. 208 (1900); *Stenandrium punctatum* Griseb. Cat. Pl. Cub. 196 (1866)).

tenis was proposed for *G. pedicularia* and two very doubtfully distinct species, and *Agalinis* ("remarkable flax") for the purple-flowered species of the *G. purpurea* alliance. The distinctive characters of *Aureolaria* and *Agalinis*, the two genera retained by Pennell for the Coastal Plain members of the genus "*Gerardia*," are thus stated by him (l. c. 404–5).

"Corolla yellow. Anther-sacs parallel, awned at base. Capsule acute to acuminate. Seeds wingless or winged...3. *Aureolaria.*

"Corolla pink or purple. Anther-sacs more or less divergent, obtuse to mucronate-awned at base. Capsule rounded at apex. Seeds wingless.....4. *Agalinis.*"

These characters, it must be confessed, are much more impressive as thus stated than as shown by the specimens themselves. While



Figs. 6–8.— Fig. 6. "*Gerardia*" *pedicularia* L. ("*Aureolaria*".— Rumford, Maine, 1889. *Parlin*). Fig. 7. "*G.*" *peduncularis* Benth. ("*Agalinis*".— Chiapas, *Ghiesbreght* 685). Fig. 8, "*G.*" *tenuifolia* Vahl ("*Agalinis*".— Orange, Connecticut, 12 Sept., 1900, *Bissell*).— All × 5.

the species of the *G. virginica* group have obviously awned anthers, with awns $\frac{1}{4}$–$\frac{1}{2}$ the length of the sacs, there is a very obvious mucro at the base of the cells in many of the purple-flowered species (*Agalinis*), and in *G. peduncularis* Benth., a purple-flowered Mexican species with the habit of *G. purpurea*, which has been referred by Dr. Pennell in mss. notes in the Gray Herbarium to *Agalinis*, the short awns or long mucros, as they may indifferently be called, are precisely intermediate between typical ones of the two groups, and almost identical in relative length with those of *G. grandiflora*, a close ally of *G. virginica*. The unsatisfactory character of the anther-appendages as a means of distinction between the two groups is indicated by figures 6–8, which, while perhaps not strictly accurate in respect to the degree of divergence of the anther-cells, since they are drawn from dried specimens

which have been boiled out, are at any rate so in respect to the awns. Fig. 6 represents a species referred to *Aureolaria*, figs. 7–8 two species referred to *Agalinis* by Dr. Pennell. It does not seem to the writer that the differences in color of flowers and shape of capsule are properly to be taken as of generic value, although they do furnish good group characters. The best course seem to be the retention of the genus as circumscribed by the matured judgments of Gray and of Bentham, adopting for it the name *Agalinis*, to which (in its restricted sense) belong the majority of the species. The following new combinations are required for the species in the Gray's Manual range.

Agalinis Raf. New Fl. ii. 61 ("1836"=1837).— *Aureolaria* Raf. l. c. 58. *Panctenis* Raf. l. c. 60. *Gerardia* auth., not L. restr.

Subg. **Panctenis** (Raf.).— *Gerardia* sect. *Pedicularioides* Benth. Comp. Bot. Mag. i. 204, 205 (1836).[1] *Aureolaria* and *Panctenis* Raf. ll. cc. (1837). *Gerardia* § *Dasystoma* Gray, Man. ed. 1. 306 (1848), not *Dasistoma* Raf., the name-bringing syn. *Aureolaria* subg. *Panctenis* (Raf.) Pennell, Bull. Torr. Club xl. 408 (1913).

Subg. **Otophylla** (Benth.)— *Gerardia* sect. *Otophylla* Benth. ll. cc. (1836).

Subg. **Euagalinis**, nom. nov.— *Gerardia* sect. *Eugerardia* Benth. l. c. 204, 206 (1836).— Type species *A. purpurea* (L.) Pennell.— The elevation of these groups to subgenera, which seems desirable in view of their characters, makes it possible to avoid the use of Bentham's name, which has now become unappropriate.

Agalinis **pedicularia** (L.) comb. nov.— *Gerardia pedicularia* L. Sp. ii. 611 (1753).

Agalinis pedicularia (L.) Blake var. **ambigens** (Fernald) comb. nov.— *Gerardia pedicularia* var. *ambigens* Fernald, Rhodora x. 86 (1908).

Agalinis pedicularia (L.) Blake var. **pectinata** (Nutt.) comb. nov.— *Gerardia pedicularia* var. *pectinata* Nutt. Gen. ii. 48 (1818).

Agalinis pedicularia (L.) Blake var. **caesariensis** (Pennell) comb. nov.— *Aureolaria pedicularia caesariensis* Pennell, Bull. Torr. Club xl. 413 (1913).

Agalinis **grandiflora** (Benth.) comb. nov.— *Gerardia grandiflora* Benth. Comp. Bot. Mag. i. 206 (1836).

Agalinis grandiflora (Benth.) Blake var. **serrata** (Benth.) comb.

[1] According to a letter from Mr. B. D. Jackson, at the Gray Herbarium, pages 193–224 of the first volume of the "Companion to the Botanical Magazine," including the whole of Bentham's "Synopsis of the Gerardieae," were issued in Feb. 1836.

nov.— *Dasystoma Drummondii* var. *serrata* Benth. in DC. Prod. x. 521 (1846). *G. serrata* Torr. ex Benth. l. c. as syn. *G. grandifolia* var. *serrata* (Torr.) Rob. Rhodora x. 35 (1908).

Agalinis **virginica** (L.) comb. nov.— *Rhinanthus virginicus* L. Sp. ii. 603 (1753). *Gerardia flava* L. 610.

Agalinis **glauca** (Eddy) comb. nov.— *Gerardia glauca* Eddy, Med. Repos. N. Y. hex. 2. v. 126 (1808). *Gerardia virginica* BSP. Prel. Cat. 40 (1889), not *Rhinanthus virginicus* L.; Robinson & Fernald in Gray, Man. ed. 7. 730 (1908).

Agalinis **laevigata** (Raf.) comb. nov.— *Gerardia laevigata* Raf. Ann. Nat. 13 (1820).

Agalinis **auriculata** (Michx.) comb. nov.— *Gerardia auriculata* Michx. Fl. ii. 20 (1803).

Agalinis **densiflora** (Benth.) comb. nov.— *Gerardia densiflora* Benth. Comp. Bot. Mag. i. 206 (1836).

Agalinis tenuifolia (Vahl) Raf. var. **macrophylla** (Benth.) comb. nov.— *Gerardia tenuifolia* var. *macrophylla* Benth. Comp. Bot. Mag. i. 209 (1836).

12. *Gnaphalium obtusifolium* L. Sp. ii. 851 (1753).[1] In the Synoptical Flora (i. pt. 2. 234 (1884)) this name was synonymized by Dr. Gray with *G. polycephalum* Michx., but rejected because "a false name taken from the char. and figure of the doubtful plant of Dill. Elth.", and the sixth and seventh editions of Gray's Manual have followed this usage. However, this view is not sanctioned by modern practices of nomenclature. Clayton's no. 203, at the British Museum, basis of the Gronovian reference, is *G. polycephalum*, and the figure and description of Morison refer likewise to this species. The figure of Dillenius, as well as his description, seems to the writer to agree well with the plant later described as *G. Helleri* Britton in breadth of leaf, pubescence, and other features. This Dillenian reference, based on a plant probably altered by cultivation, has been a source of doubt from early

[1] *Gnaphalium obtusifolium.*

"8. GNAPHALIUM foliis lanceolatis, caule tomentoso, ramoso, floribus terminalibus glomeratis conicis.

"Gnaphalium foliis lanceolatis, caule tomentoso, corymbis supra decompositis, floribus sessilibus confertis. *Gron. virg.* 95.

"Elichrysum obtusifolium, capitulis argenteis conglobatis. Dill. *elt.* 130. *t.* 108. *f.* 131.

"Helichrysum Chrysocoma Gnaphalioides virginiana annua, foliis obtusioribus, capitulis argenteis conglobatis. *Moris. hist.* 3. *p.* 88. *s.* 7. *t.* 10. *f.* 19.

"*Habitat in* Virginia, Pensylvania. ☉

"Caulis *tomentosus, pilosus, ramosus, erectus.* Folia *lanceolata, recurvata, nudiuscula.* Flores *terminales, conglobati, inaequales, subsessiles.* Calyces *conici, albi, acuti.* Corollae *flavae.*"

times. Michaux's name *G. polycephalum* was based on *G. obtusifolium* after the exclusion of this same reference ("Obs. *G. obtusifolium*, Linn., omisso synonymo Dillenii, qui plantam cultura mutatam tradidit"). This doubtful element of the Linnaean species, however, can not be considered of sufficient importance to outweigh the fact that all the other constituents are identical with *G. polycephalum*, even though the Linnaean name was taken from Dillenius's specific name ("*Elichrysum obtusifolium, capitulis argenteis conglobatis*"). Such a borrowing of names, often practiced by Linnaeus, cannot logically be regarded as determining the types of the Linnaean species in the same way as in the case of "name-bringing synonyms" in modern binomialism.

The plant described by Britton as *Gnaphalium Helleri* (Bull. Torr. Club xx. 280 (1893)) seems better treated as a variety, as it was by Torrey & Gray (*G. polycephalum* β.) and by Fernald (*G. polycephalum* var. *Helleri* (Britton) Fernald, Rhodora x. 94 (1908)). If the wool of a specimen of *G. obtusifolium* be removed, stipitate glands precisely similar in shape and position to those of the variety are found. It seems fairly certain, then, that the latter represents only a form of the type which lacks the tomentum. It should be called Gnaphalium obtusifolium L. var. **Helleri** (Britton).

The changes in nomenclature here proposed may for convenience be summarized in systematic order as follows. The numbers in parentheses are those under which the species will be found in the preceding discussion.

(1) Eleocharis capitata (L.) R. Br.— *E. tenuis* (Willd.) Schultes.

(1) E. caribaea (Rottb.) Blake — *E. capitata* of auth.

(1) E. caribaea (Rottb.) Blake var. dispar (E. J. Hill) Blake — *E. capitata* var. *dispar* (E. J. Hill) Fernald.

(2) Fimbristylis autumnalis (L.) R. & S.— *F. Frankii* Steud.

(2) F. autumnalis (L.) R. & S. forma brachyactis (Fernald) Blake — *F. Frankii* Steud. var. *brachyactis* Fernald.

(2) F. mucronulata (Michx.) Blake — *F. autumnalis* of auth.

(3) Rynchospora capitellata (Michx.) Vahl — *R. glomerata* of auth. For varieties, see discussion.

(3) R. glomerata (L.) Vahl — *R. glomerata* var. *paniculata* (Gray) Chapm.

(4) Dioscorea villosa L.— *D. paniculata* Michx.

(4) D. villosa L. var. glabrifolia (Bartlett) Blake — *D. paniculata* Michx. var. *glabrifolia* Bartlett.

(5) Helianthemum propinquum Bicknell — *H. majus* of auth.

(6) Oenothera fruticosa L.— *O. linearis* Michx.

(6) O. fruticosa L. var. Eamesii (Rob.) Blake — *O. linearis* Michx. var. *Eamesii* Rob.

(6) O. hybrida Michx.— *O. fruticosa* var. *hirsuta* Nutt.

(6) O. hybrida Michx. var. ambigua (Nutt.) Blake — *O. fruticosa* of auth.

(7) Thaspium trifoliatum (L.) Gray — *T. aureum* var. *atropurpureum* (Desr.) Coult. & Rose.

(7) T. trifoliatum (L.) Gray var. flavum Blake — *T. aureum* of auth.

(10) Gratiola neglecta Torr.— *G. virginiana* of auth.

(10) G. virginiana L.— *G. sphaerocarpa* Ell.

(11) Agalinis Raf.— *Gerardia* of Gray's Man. ed. 7.

(11) A. subg. Euagalinis Blake — *Gerardia* sect. *Eugerardia* Benth.

(11) A. subg. Otophylla (Benth.) Blake — *Gerardia* sect. *Otophylla* Benth.

(11) A. subg. Panctenis (Raf.) Blake — *Gerardia* sect. *Dasystoma* Gray.

(11) A. auriculata (Michx.) Blake — *Gerardia auriculata* Michx.

(11) A. densiflora (Benth.) Blake — *Gerardia densiflora* Benth.

(11) A. glauca (Eddy) Blake — *Gerardia virginica* of auth.

(11) A. grandiflora (Benth.) Blake — *Gerardia grandiflora* Benth.

(11) A. grandiflora (Benth.) Blake var. serrata (Benth.) Blake — *Gerardia grandiflora* Benth. var. *serrata* (Torr.) Rob.

(11) A. laevigata (Raf.) Blake — *Gerardia laevigata* Raf.

(11) A. pedicularia (L.) Blake — *Gerardia pedicularia* L.

(11) A. pedicularia (L.) Blake var. ambigens (Fernald) Blake — *Gerardia pedicularia* L. var. *ambigens* Fernald.

(11) A. pedicularia (L.) Blake var. caesariensis (Pennell) Blake — *Aureolaria pedicularia caesariensis* Pennell.

(11) A. pedicularia (L.) Blake var. pectinata (Nutt.) Blake — *Gerardia pedicularia* L. var. *pectinata* Nutt.

(11) A. tenuifolia (Vahl.) Raf. var. macrophylla (Benth.) Blake — *Gerardia tenuifolia* Vahl var. *macrophylla* Benth.

(11) A. virginica (L.) Blake — *Gerardia flava* of auth.

(12) Gnaphalium obtusifolium L.— *G. polycephalum* Michx.

(12) G. obtusifolium L. var. Helleri (Britton) Blake — *G. polycephalum* Michx. var. *Helleri* (Britton) Fernald.

Gray Herbarium.

DATES OF EATON'S FERNS OF NORTH AMERICA.

Mary A. Day.

Mr. W. R. Maxon has called my attention to the fact that there is no evidence in the two volumes of D. C. Eaton's Ferns of North America that the work was issued in fascicles or that each complete volume was not published at a single date. In looking through the contemporary periodicals, however, I find notices from time to time of the publication of separate parts, twenty-seven having been issued between the last part of 1877 and August, 1880, when the work was completed. These notices were found in American Journal of Science, Botanical Gazette and Bulletin of the Torrey Botanical Club as follows: —

Vol. 1.	Parts	Reviewed in	Date
Pt. I	pp. 1–20	Am. Jour. Sci. ser. 3, xv. p. 72	Jan. 1878
	pl. 1–3.	Bot. Gaz. iii. p. 15	Feb. 1878
Pt. II	pp. 21–43	Am. Jour. Sci. ser. 3, xv. p. 223	Mar. 1878
	pl. 4–6	Bot. Gaz. iii. p. 40	Apr. 1878
Pt. III	pp. 44–72	Am. Jour. Sci. ser. 3, xv, p. 319	Apr. 1878
	pl. 7–9	Bot. Gaz. iii, p. 40	Apr. 1878
Pt. I–III		Bull. Torr. Bot. Club, vi. p. 208	Feb. 1878
Pt. IV & V	pp. 73–113	Bull. Torr. Bot. Club, vi. p. 222	Apr. 1878
	pl. 10–15	Am. Jour. Sci. ser. 3, xv, p. 483	June 1878
		Bot. Gaz. iii. p. 56	June 1878
Pt. VI & VII	pp. 114–160	Am. Jour. Sci. ser. 3, xvi, p. 240	Sept. 1878
	pl. 16–21		
Pt. VIII & IX	pp. 161–208	Am. Jour. Sci. ser. 3, xvi. p. 487	Dec. 1878
	pl. 22–27		
Pt. X & XI	pp. 209–256	Bot. Gaz. iv. p. 116	Jan. 1879
	pl. 28–33		
Pt. XII & XIII	pp. 257–304	Bull. Torr. Bot. Club, vi. p. 298	Mar. 1879
	pl. 34–39	Bot. Gaz. iv. p. 149	Apr. 1879
		Am. Jour. Sci. ser. 3, xvii. 338	Apr. 1879
Pt. XIV & XV	pp. 305–352	Bot. Gaz. iv. p. 174	June 1879
	pl. 40–45		
Vol. 2.			
Pt. XVI & XVII			
Pt. XVIII & XIX			
Pt. XX & XXI		Letter of D. C. E. to A. Gray "in press"	Sept. 1879
Pt. XXII & XXIII			

Vol. 2.	Parts	Reviewed in	Date
Pt. XXIV–XXVII	pp. 181–272 pl. 70–81	Bot. Gaz. v. p. 59	May 1880
Completion of the work	273–285	Literary World, xi. p. 296,	28 Aug. 1880
		Am. Jour. Sci. ser. 3, xx. p. 157	Aug. 1880

The complete work is not covered by these notices, nor is the exact date of publication of the numbers of the periodicals given. Wishing to get more accurate data I sent to Mr. C. E. Faxon, one of the illustrators, the information I had found and asked if he could add to it. Fortunately he had kept his copy in the original covers and had recorded on each part the date on which it was received by him. A few days before his death he very kindly sent the following compilation to me with the permission to use it in this article.

Fascicles.	Pages and plates.	Received by Mr. Faxon.
Pt. I	pp. 1–20, pl. 1–3	Nov. 28, 1877
" II	" 21–44, " 4–6	Jan. 31, 1878
" III	" 45–68, " 7–9	Feb. 28, 1878
" IV–V	" 69–114, " 10–15	Apr. 30, 1878
" VI–VII	" 115–160, " 16–21	July 24, 1878
" VIII–IX	" 161–208, " 22–27	Oct. 7, 1878
" X–XI	" 209–256, " 28–33	Dec. 18, 1878
" XII–XIII	" 257–304, " 34–39	Feb. 21, 1879
" XIV–XV	" 305–352, " 40–45	May 7, 1879
" XVI–XVII	" i–xiv. Vol. I; 1–32 Vol. II. pls. 46–51	June 17, 1879
" XVIII–XIX	" 33–80, pls. 52–57	Aug. 19, 1879
" XX–XXI	" 81–128, " 58–63	Oct. 14, 1879
" XXII–XXIII	" 129–176, " 64–69	Dec. 23, 1879
" XXIV–XXVII	" 177–272, " 70–81	Apr. 1, 1880
pp. I–XXXI. 273–285.	"Rec'd several weeks later."	

Although these dates of receipt were doubtless in each case from one to several days later than those of actual issue, the source of the information was so trustworthy and the approximation to the times of publication obviously so close, that it seems well worth while to place the data on published record.

Gray Herbarium.

THE VALIDITY OF OXALIS AMERICANA.

M. L. Fernald.

The Wood Sorrel of the northern mossy forests of eastern America has been known in all American writings since the days of Michaux and Pursh as *Oxalis Acetosella* L., thus implying the identity of our plant with the European species. Only at one period in American Systematic Botany has the identity of the American and European plants been questioned, and then only in a half-hearted way. In 1824, DeCandolle [1] published the American plant as *Oxalis americana* Bigelow *in litt.*, separating it from the European plant, *O. Acetosella*, by its oblong unequally emarginate petals, as contrasted with the oval obtuse (not emarginate) petals of the European *O. Acetosella*. Bigelow himself in the same year (1824) treated the American plant as *O. Acetosella* with the comment: "The American plant has the petals oblong and unequally bilobate, a character which might be considered specific, did not the European plant, as I find from specimens, sometimes present the same figure." [2] Zuccarini, however, in his *Monographie der amerikanischen Oxalis-Arten* took up Bigelow's *O. americana*,[3] and again in his *Nachtrag* recognized *O. americana* as a distinct species.[4] All subsequent authors, however, have followed Bigelow's own printed statement and have not attempted to separate the American from the European plant.

Our North American Wood Sorrel belongs distinctly in the Canadian zone, overlapping slightly into the Hudsonian, where it occurs in cool mossy woods, abounding through Canada from the southern side of the Labrador Peninsula to the Great Lake region, and south into northern New England and New York, and very locally at high elevations or in cool mountain woods southward to the high mountains of North Carolina and Tennessee, and flowering in summer, from mid-June to August. *O. Acetosella* of Europe is a plant widely dispersed over the continent, running south quite to the Mediterranean region, and growing in apparently much drier open habitats, judging from

[1] DC. Prodr. i. 700 (1824).
[2] Bigel. Fl. Bost. ed. 2, 258 (1824).
[3] Zucc. Mon. am. Ox. 26 (1825).
[4] Zucc. Nachtr. Mon. am. Ox. 35 (1831).

photographs which show *O. Acetosella* associated in colonies with *Anemone nemorosa* and other plants of open woods; and in Europe the plant flowers in early spring, mostly in April and early May. Thus it would seem that *O. Acetosella* of Europe is one of the early spring flowers of open sunny woods, while its North American representative is a summer-flowering plant of the dense Canadian spruce and fir forests. This discrepancy in the flowering seasons and the ranges of the plants at once suggests that they are probably not conspecific, since most plants of Canadian distribution in America occur, when they are found in Europe, much farther north than with us.

The examination of very many plates, in fact all the plates found of the European species, shows the petals to be represented always as obovate and entire, or merely undulate or very obscurely notched at summit; the American material having, as Bigelow said, oblong petals with a conspicuously oblique notch at the tip. Some herbarium material of the European plant, poorly dried, appears, apparently by shrinkage, to be slightly emarginate, but it is significant that the European plates are so constant in showing scarcely any notching. Other characters appear upon investigation. For instance, the capsule produced from the petaliferous flowers in the European plant is conic-ovoid, this form showing not only in herbarium material but in all the excellent European plates; the capsule from the petaliferous flowers of the American plant, on the contrary, is depressed-globose, barely tapering at summit and in some cases almost oblate. The seed of the European plant is conspicuously ribbed with acutish parallel ridges, but the seed of the American plant has these ridges nearly or quite obsolete, the surfaces being smooth or only obscurely ridged. The sepals of the European plant have very delicate marginal hairs, which are usually appressed to the margin and not readily seen, while the sepals of the American plant are conspicuously hispid-to villous-ciliate with widely spreading reddish hairs. Another character of fair constancy appears in the rootstock. In the American plant the persistent bases of the old petioles are conspicuous on the rootstocks on account of the circular calloused tip (the point of disarticulation of the old petioles); in the European material and in the European plates these calloused tips are rarely seen, this difference arising from the fact that in the American plant the disarticulation of the petiole takes place above the tips of the subtending persistent stipules, in the European well below the tips of the stipules.

These differences between the plants, as well as the pronounced difference in the distribution of the European and the American Wood Sorrels indicate that DeCandolle and Zuccarini were correct in maintaining the American plant as a distinct species, and that Bigelow's first impulse to separate the American plant was well grounded, although he afterward, from failing to observe the numerous concomitant characters, reduced his own species. The Wood Sorrel of northeastern America should, therefore, be known as *Oxalis americana* Bigelow.

The typical *Oxalis americana* has the petals white, delicately lined with pink or crimson, rarely with the pink tinge nearly or quite absent. Occasionally colonies are found with the petals bright rose-purple, quite parallel with the European plants which have been called *O. Acetosella,* var. *subpurpurescens* DC. These plants, however, represent merely a color form, which occurs more or less sporadically through the range of the typical form of the species, and they are best treated as forms rather than as varieties. The form with the rose-purple petals in America may be called

Oxalis americana Bigelow, forma **rhodantha**, n. f., petalis purpureis.

Petals purple.— Maine: swamp, Chesterville, July 3, 1906, *Agnes Chase & Lillian O. Eaton.* New Hampshire: Crawford Notch, *C. E. Faxon* (type in Gray Herb.). Vermont: Garden of Eden, Eden, Lamoille Co., July 19, 1916, *C. H. Knowlton;* mountainside, Manchester, 1892, *A. J. Grout.*

Gray Herbarium.

A VARIETY OF SMILAX GLAUCA.

S. F. Blake.

Some years ago I became acquainted with the fact that *Smilax glauca* Walt., as generally understood, comprises two distinct forms — one a plant with leaves quite smooth or, under a lens, very obscurely papillose beneath, the other with the leaves prominently roughened beneath, either chiefly on the veins or densely over the whole surface, with short subglanduliform bluntish papillae, or even hirtellous-pul-

verulent. The former, if one may judge from the material in the Gray Herbarium, ranges from Massachusetts to North Carolina, and occurs again in Florida and Oklahoma. The latter is represented in the Gray Herbarium and the United States National Herbarium by material from Virginia to northern Florida (Jacksonville), west to Texas (Houston) and north to Ohio and Illinois. The material of this papillose form was separated by the writer in the two herbaria mentioned under a manuscript name, the smooth and more northern-ranging plant being taken as the typical form of the species. Publication of the variety was delayed, however, as the writer expected to have an opportunity to examine the type in Walter's herbarium in the British Museum. However, careful examination of the Walter Herbarium showed no specimen representing Walter's name. In the De Candolle (general) Herbarium at Geneva, however, I found a good specimen of the plant with leaves densely pulverulent beneath, which was labeled "Smilax sarsaparilla L. Carol. merid. Fraser." It seems to the writer that this specimen of Fraser's may be taken, in the lack of any direct evidence from the Walter Herbarium, as indicating the varietal identity of Walter's *Smilax glauca*.[1] It is not suggested that this plant of Fraser's is in any sense a type of Walter's *S. glauca*, but merely that, coming as it does from somewhere near the type locality of Walter's plant, all means for absolutely identifying which are now forever lost, it affords sufficiently strong presumptive evidence of the identity of Walter's *S. glauca* with the papillose form to justify the restricted use of the name in this sense. To this it may be added that the papillose form is much the commoner of the two south of Virginia and that the smooth-leaved form, so far as is shown by the herbaria consulted, is not found in South Carolina.

The two varieties of *Smilax glauca* here recognized may be distinguished as follows.

SMILAX GLAUCA Walt. var. **genuina**: foliis subtus dense papillosis vel hirtello-pulverulentis.— *S. glauca* Walt. Fl. Car. 245 (1788), as here restricted.— VIRGINIA: Bedford Co., 1871, *Curtiss* (U. S.[2]). NORTH CAROLINA: near Waynesville, 900–1500 m., 1910, *Standley* 5513 (U. S.), 5589 (U. S.); Biltmore, 1896–97, *Biltmore Herbarium* 1322, 1322b; Swain Co., 515 m., 1891, *Beardslee & Kofoid*; Sunburst, Haywood Co., 1911, *House* 4610. SOUTH CAROLINA: *Fraser* (hb. DC.)

[1] The description by Walter of his plant as with "foliis . . laevibus" probably refers to their unarmed character rather than to glabrosity.

[2] U. S. = United States National Herbarium; other material cited is in Gray Herbarium.

Georgia: Stone Mt., 1900, *Pollard & Maxon* 482; Tallulah Falls, Rabun Co., 485 m., 1893, *Small*; Dalton, 1900, *Wilson* 87. Florida: Jacksonville, 1893, *Curtiss* 4156 (U. S.); without def. loc., *Chapman*. Alabama: Spring Hill, 1909, *Mackenzie* 4098. Tennessee: Knoxville, 1898, *Ruth* 146 (U. S.), & 1904, *Ruth* 442. Kentucky: Pine Mt., Bell Co., 1893, *Kearney* 485. Ohio: Chillicothe, 1885, *Safford* 411 (U. S.). Illinois: Tunnel Hill, Johnson Co., 1902, *E. L. Ridgway* (U. S.). Louisiana: without def. loc., *Hale, Carpenter*. Texas: Houston, 1872, *E. Hall* 641.

Var. **leurophylla**: foliis subtus glabris laevibus vel interdum obscure punctato-subpapillosis.— Type from Massachusetts: Great Pond, Centreville, 16 June 1896, *E. F. Williams* (in Gray Herb.).— All the material examined from the coast north of Virginia (Mass., R. I., Conn., N. Y., N. J., Del., D. C.) belongs to this variety. Other specimens examined are: Virginia: Fort Myer, 1894, *Mearns;* Peak Mt., Pulaski Co., 670 m., 1892, *Small* (approaching var. *genuina*); Phoebus, 1912, *Robinson* 370; Buckroe, 1912, *Robinson* 369; near Franklin, 1893, *Heller* 1022; Western Branch, 1840, *Rugel*. West Virginia: Durbin, 1904, *Greenman* 134. North Carolina: Tryon, 1899, *Churchill*. Florida; Eustis, 1894, *Nash* 564. Oklahoma: near Page, Laflore Co., 1913, *Stevens* 2700 (approaching var. *genuina*); near Miami, Ottawa Co., 1913, *Stevens* 2278.

Gray Herbarium.

Vol. 20, no. 231, including pages 41 to 60 was issued 2 March, 1918.